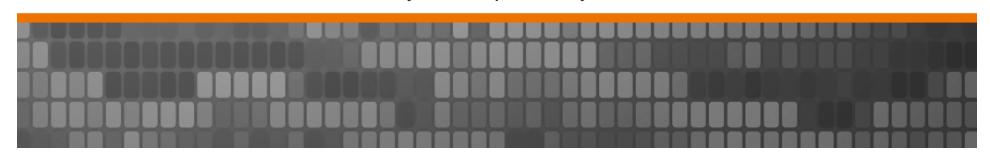


# Delta Levees Delta Stewardship Council Meeting January 26, 2012

Eileen M. White, P.E.

Manager of Water Operations

East Bay Municipal Utility District



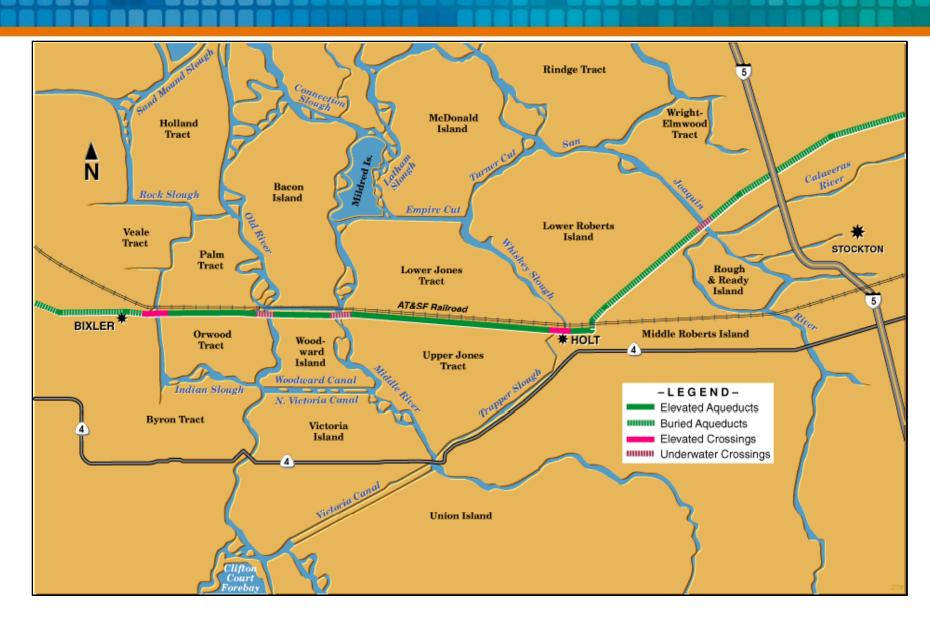
#### Delta Levee Projects



- Five Levee Projects were approved by the Delta Stewardship Council on July 28, 2011
- Projects were advertised in August 2011
- Projects were awarded in September 2011
- Notice to proceed was issued to contractors in October 2011
- To date, placed over 900,000 tons of import fill
- Four of the five projects are nearly complete

# **Levee Projects**

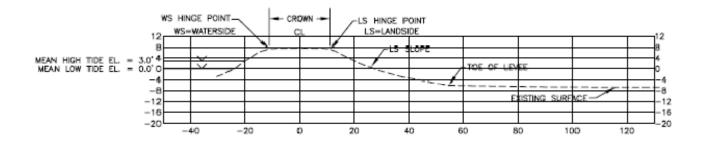






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#### LEVEE TYPICAL X-SECTION



SCALE: 1"=20'



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ENGINEER 1314 Paloma Ave. Stockson, CA 95209	I N G 209.478.6525

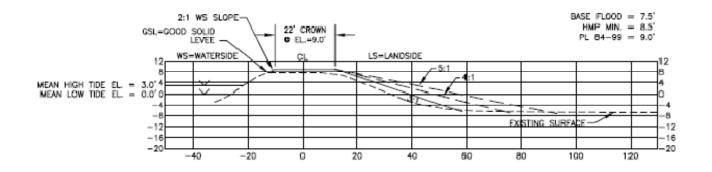
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# PL 84-99 (PUBLIC LAW 84-99, ARMY CORPS OF ENGINEERS) TEMPLATE WITH 3:1, 4:1, 5:1 LANDSIDE SLOPE TYPICAL X-SECTION



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# Lower Roberts Island





# **Lower Jones Tract**





# **Lower Jones Tract**





# **Lower Jones Tract**





# **Upper Jones Tract**





### **Woodward Island**





# **Woodward Island**





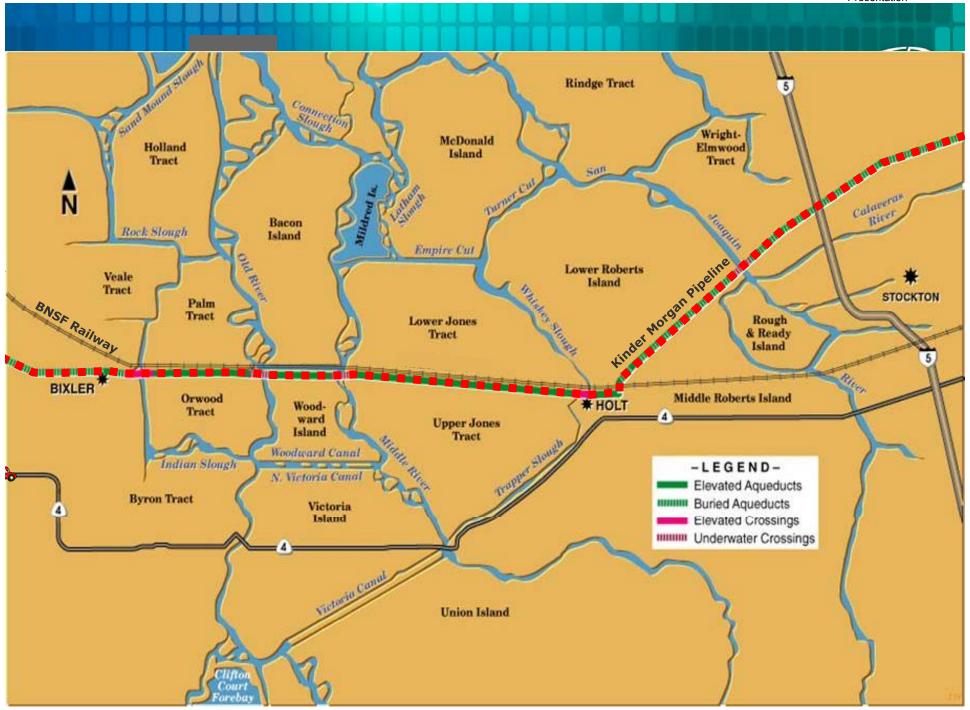
#### Summary



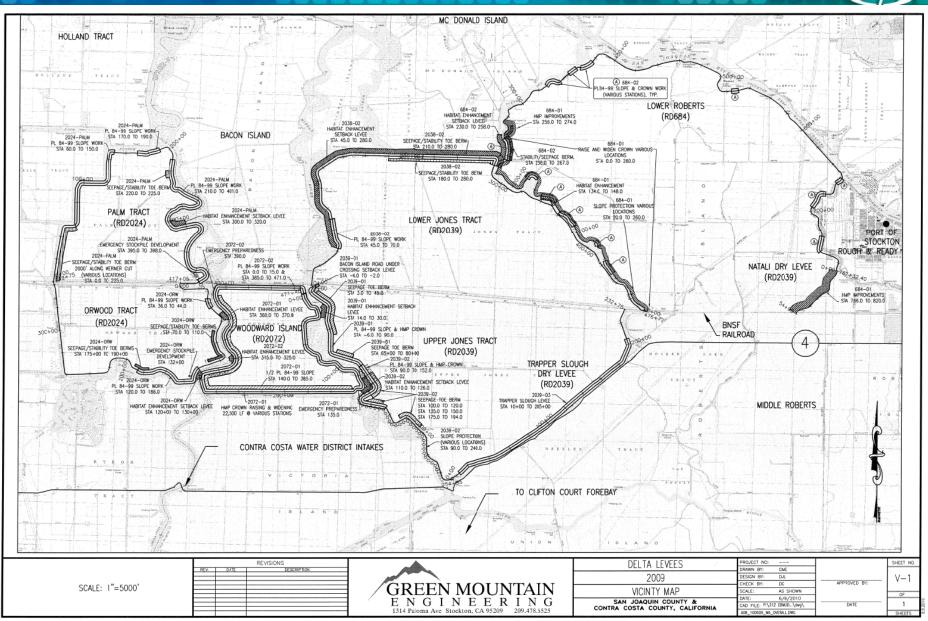
- The projects reduce the risk of levee failures in the Delta
- The projects protect assets of statewide importance
- The projects have been successful because of the collaborative partnership of DWR, the Reclamation Districts, and the Delta Stewardship Council



# THANK YOU









#### **Summary**



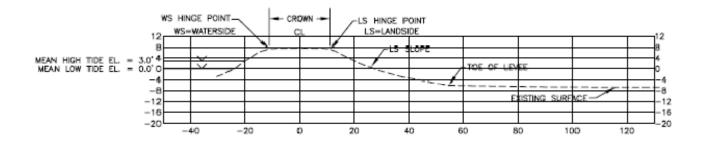
- Fund ten projects
- Total Project Cost = \$41.3 million
- State Cost Share \$35.2 million\*
- Local Cost Share = \$6.1 million\*
- Total Levee Miles Improved = 41 miles
- \* Reclamation District's receive funding





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#### LEVEE TYPICAL X-SECTION



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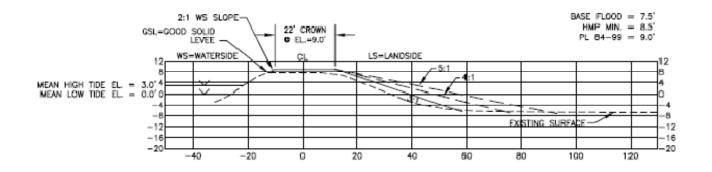
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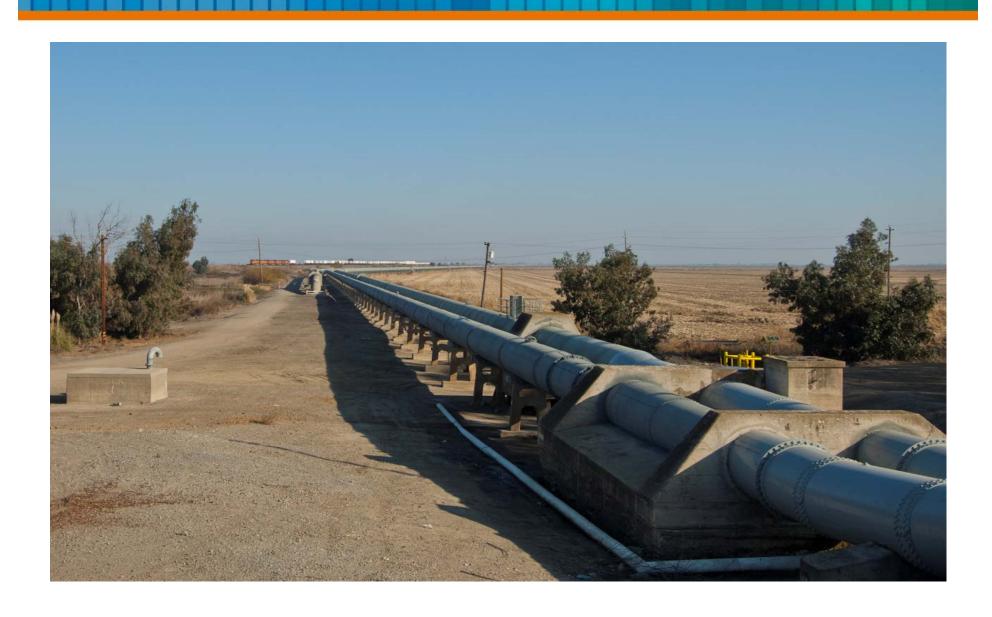
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# **Levee Work**





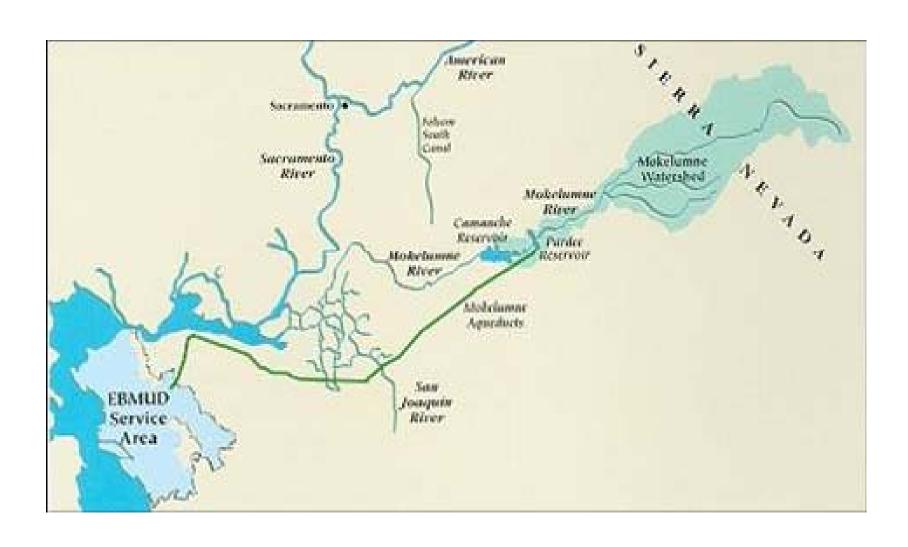
#### **Delta Levees**



- Impact of Levee Failures
- Vulnerabilities to EBMUD's Aqueducts
- Historical failures of the levees
- EBMUD's Aqueduct Levee Security Program
- Impact of Levee Failures to Critical Infrastructure
- Need for approval of \$35 million in State funds for levee improvements
- Funding Agreement
- Conclusion

# **EBMUD Water Supply System**





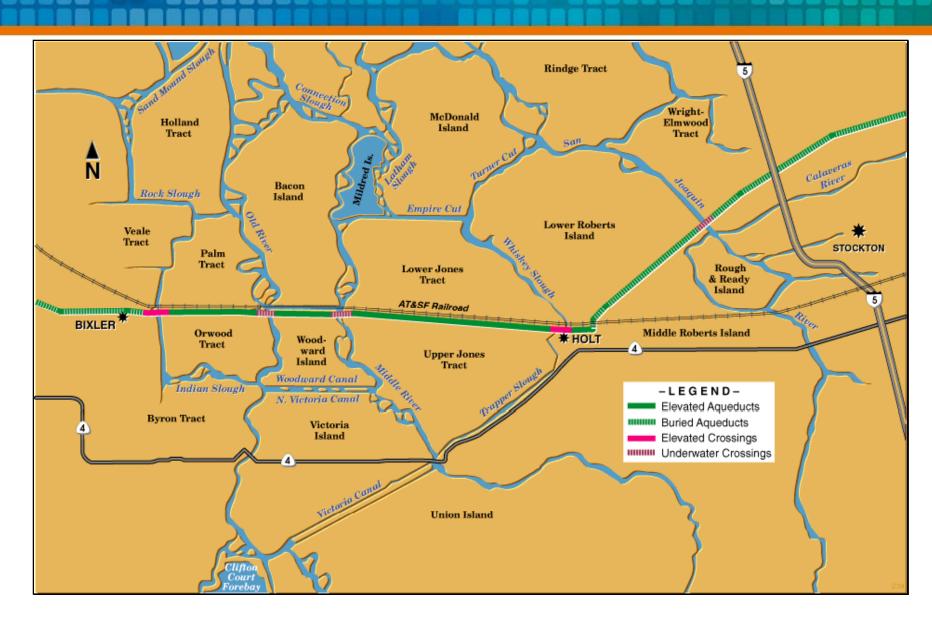
#### **Mokelumne Aqueducts in the Delta**



- Cross 5 islands/tracts
- 14 miles of pipeline on Islands/Tracts
- 10 miles are elevated
- 50 miles of levees

# **Mokelumne Aqueducts**





# SB2X -1 (Perata) Bond Fund Appropriations



- Bill allocated funding to reduce the risk of levee failures in the Delta
- Purpose is to protect assets of Statewide importance
- Reinforce levee sections near aqueducts
- Goal is to improve Delta levees to Public Law 84-99, Army Corps. of Engineers Standard

#### Failure of the Levees



- Result in flooding of the islands
- Stress adjacent islands
- Could result in progressive failures of surrounding levees
- Threaten critical facilities

#### **Aqueduct Flood Vulnerabilities**



- Instability High Winds & Waves cause stress
- Damage from floating debris
- Scour and foundation erosion
- Empty aqueducts will float
- Corrosion pipelines and coatings are not designed to be submerged

# Jones Tract Flooding - 2004











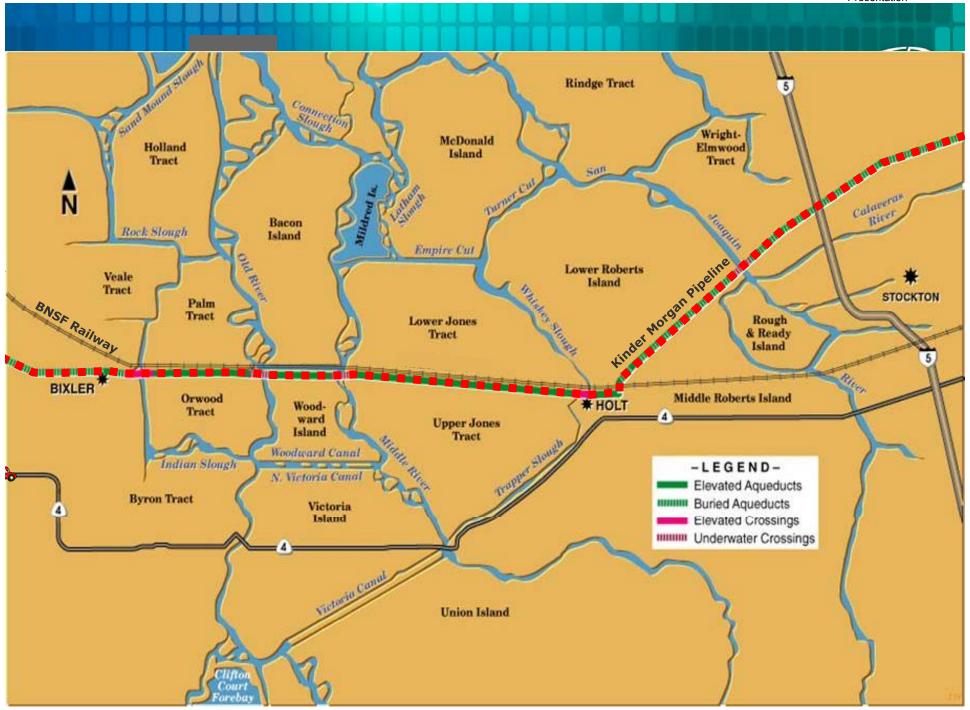




# EBMUD's Aqueduct Levee Security Program



- Began in 1997
- Support Reclamation District's effort to restore and improve the levees
- EBMUD contributed over \$15 million

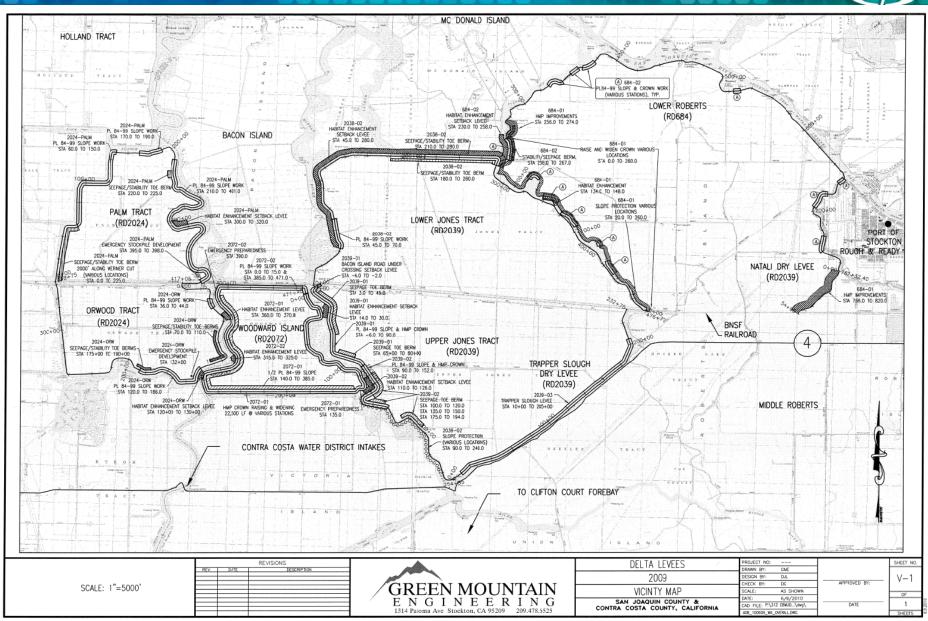


# Department of Water Resources Recommendations



- Fund ten projects
- Total Project Cost = \$41.3 million
- State Cost Share \$35.2 million\*
- Local Cost Share = \$6.1 million\*
- Total Levee Miles Improved = 41 miles
- \* Reclamation District's receive funding

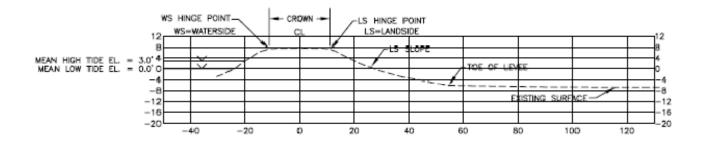






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#### LEVEE TYPICAL X-SECTION



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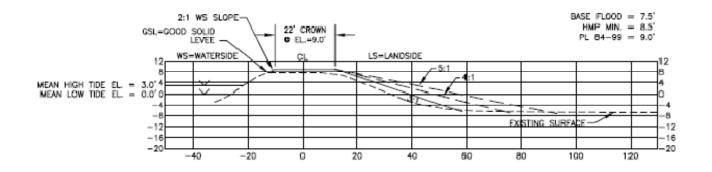
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# DWR and Reclamation Districts Agreements



- State to provide cash advances up to 90% of the 85% state funding costs
- Leaves a temporary cash burden of approximately \$4 million that will need to be financed
- RDs lack the finances to meet these costs

# EBMUD and Reclamation Districts Funding Agreement



#### **EBMUD** will:

- Provide the non-refundable local share (\$6.1 million)
- Advance temporary cash flow (approximately \$4 million)
- Maintain financial oversight

# EBMUD and Reclamation Districts Funding Agreement

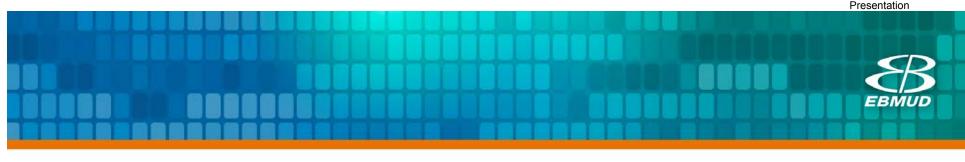


### **Reclamation Districts will:**

- Execute Grant Agreements with the Department of Water Resources
- Be the Engineer of Record
- Issue all contracts



## THANK YOU

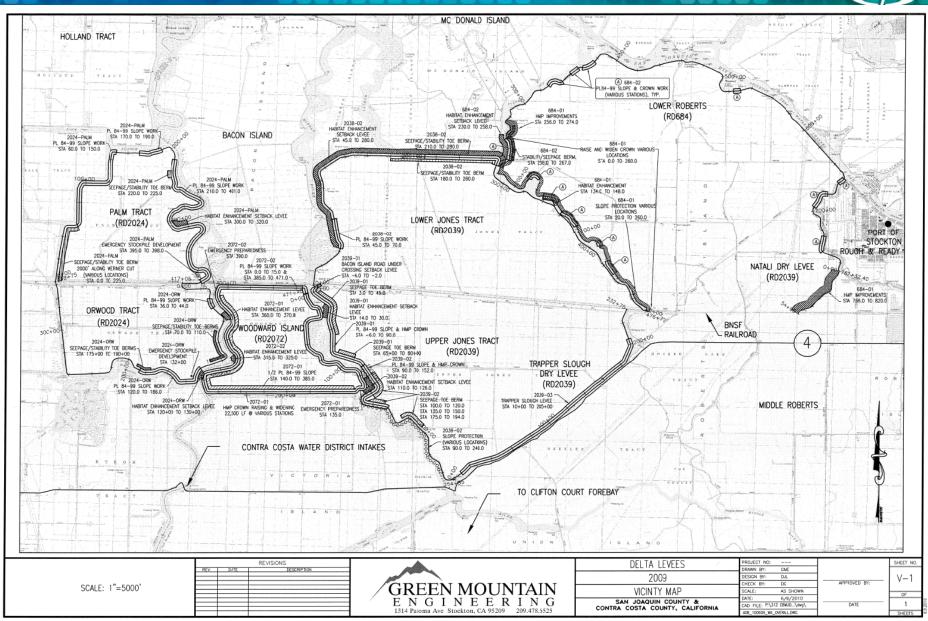


## Summary



- EBMUD continues to make voluntary financial contributions to the Reclamation Districts for levee improvements
- EBMUD has invested over \$40 million to retrofit its aqueducts
- EBMUD has worked cooperatively with DWR, Reclamation Districts, and Delta Stewardship Council on these important projects
- EBMUD requests the Council to support the \$35 million for levee improvements

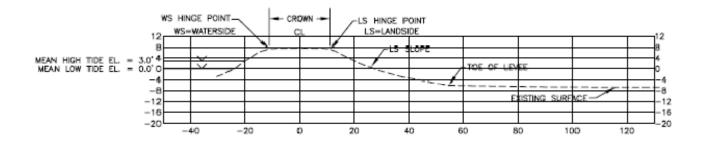






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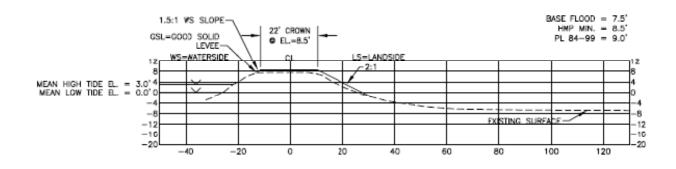


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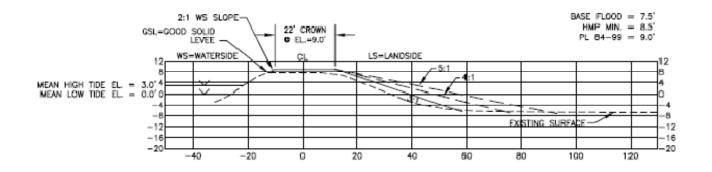
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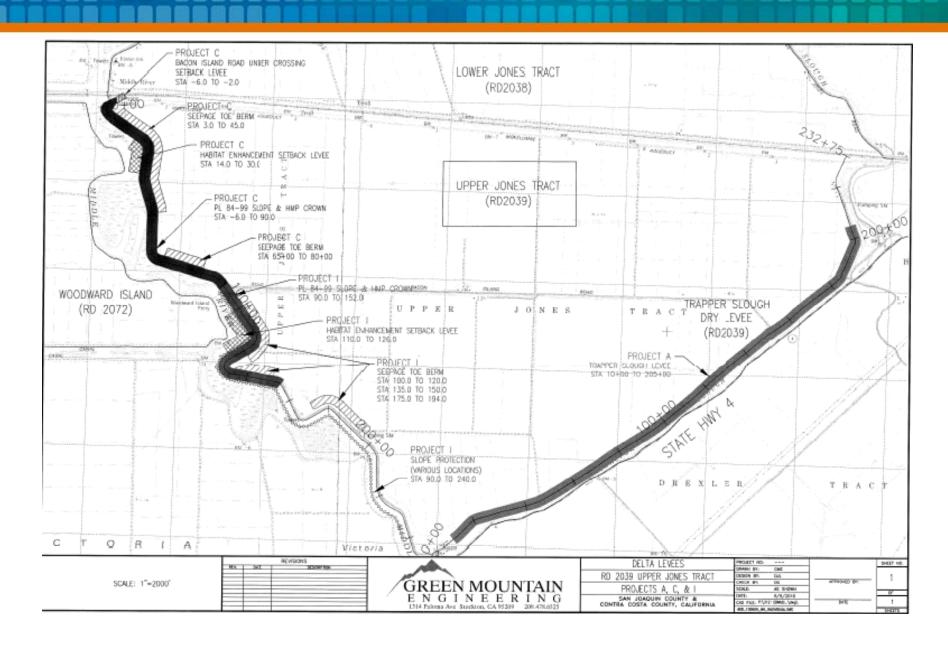
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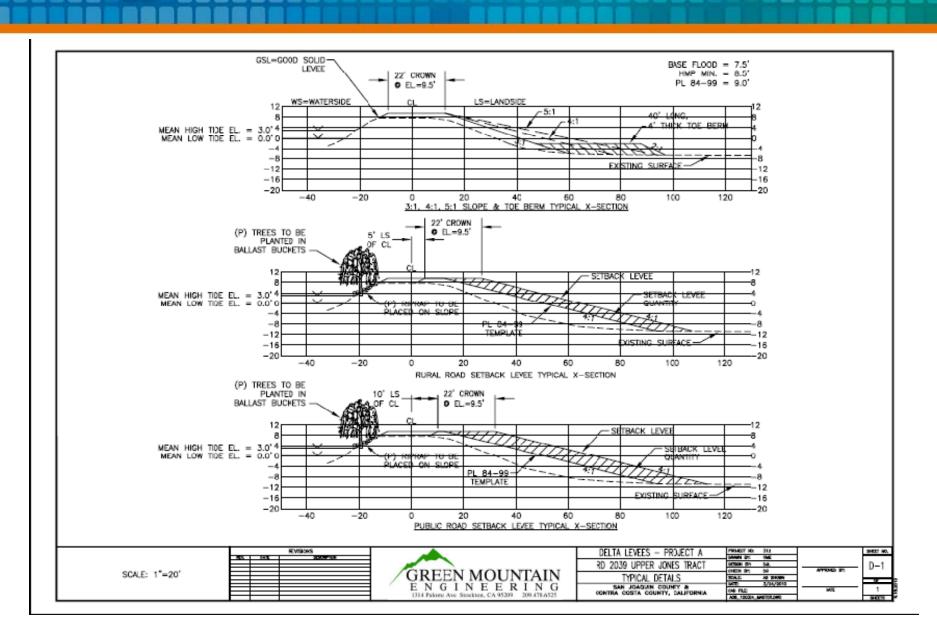


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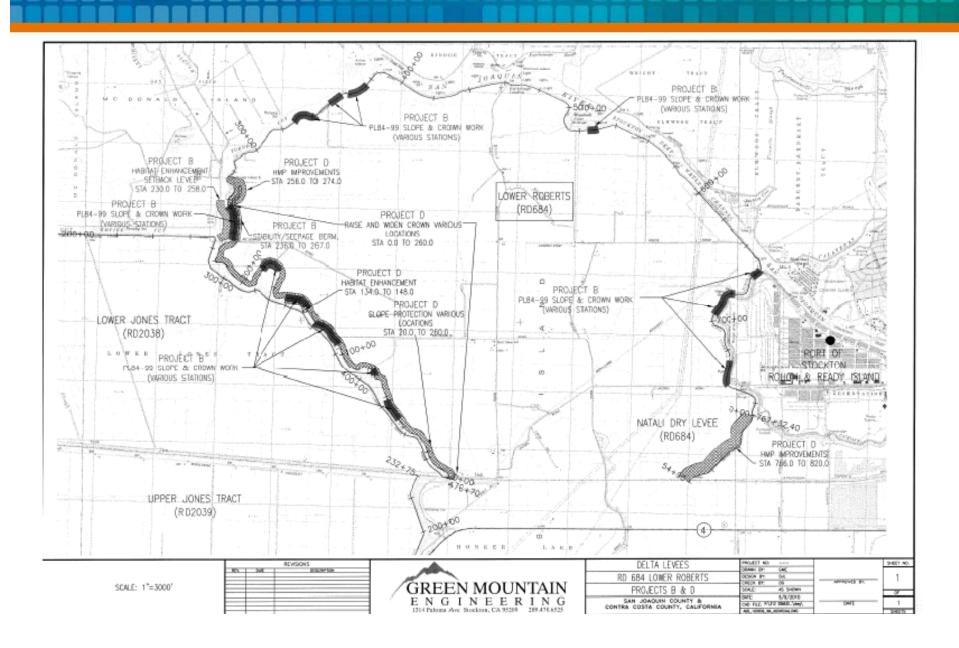
### Upper Jones Tract, Reclamation District 2039 - Project Asmur



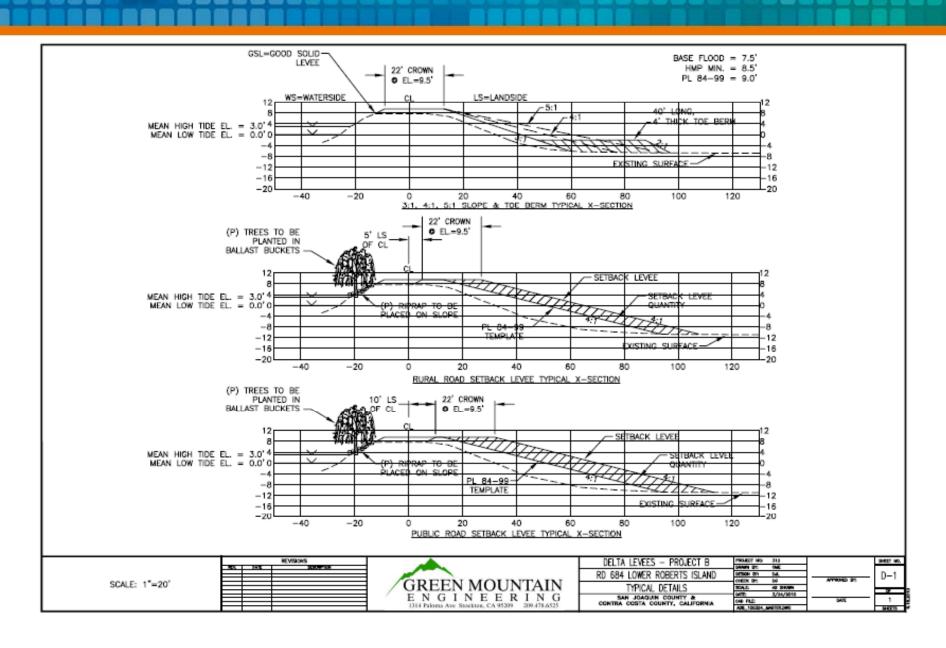
### Upper Jones Tract, Reclamation District 2039 – Project Asimus



### Lower Roberts Island, Reclamation District 684 - Project Euc

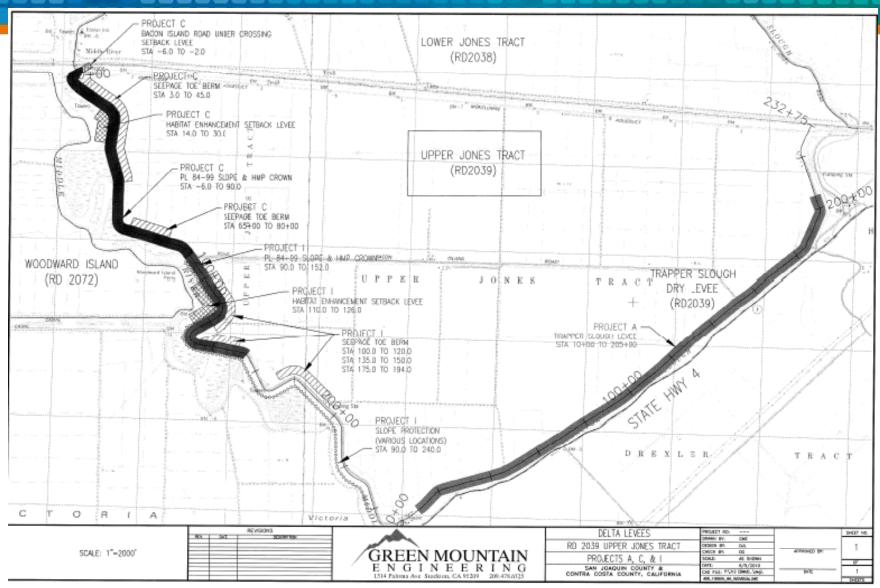


### Lower Roberts Island, Reclamation District 684 - Project Bur



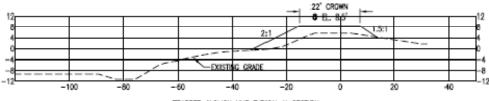
### pper Jones Tract, Reclamation District 2039 - Project





## Upper Jones Tract, Reclamation District 2039 - Project





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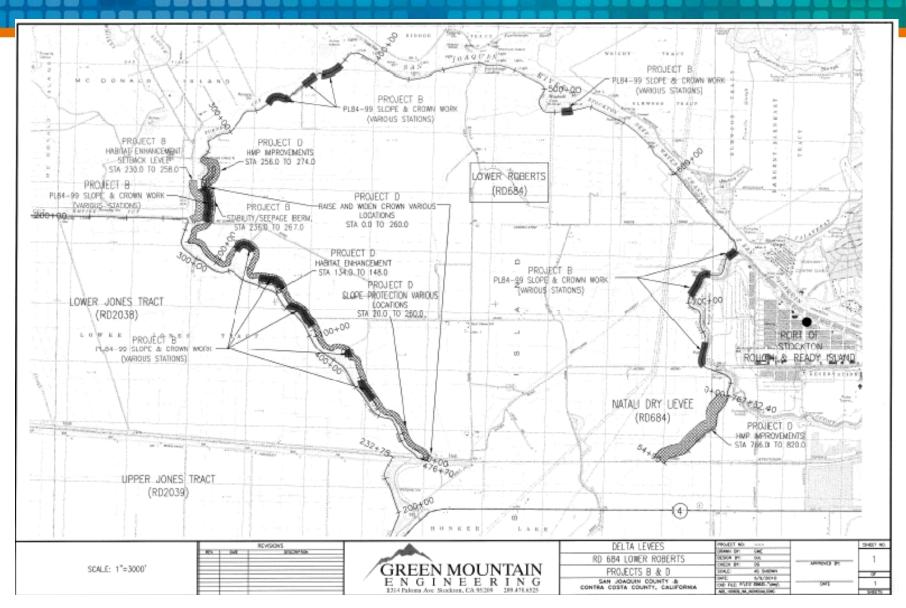


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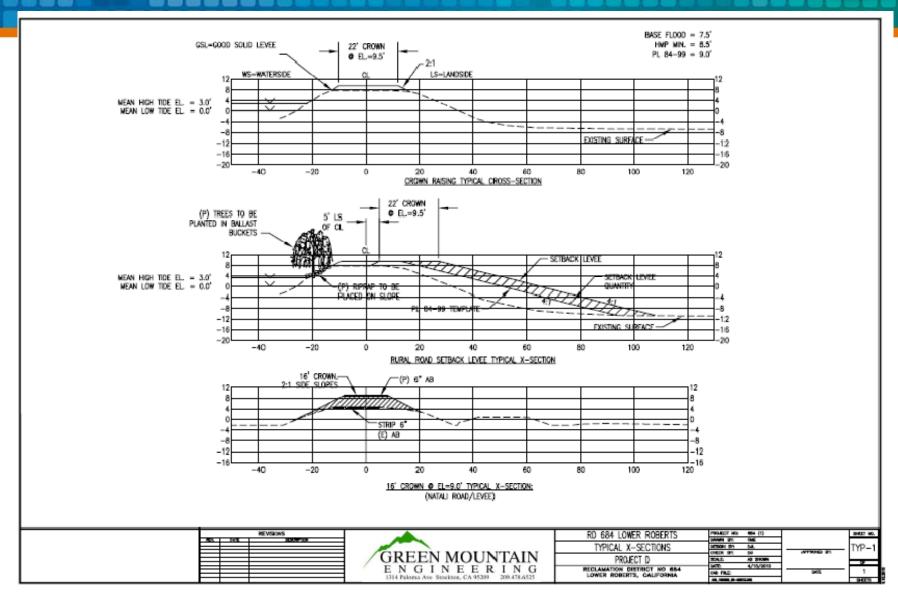
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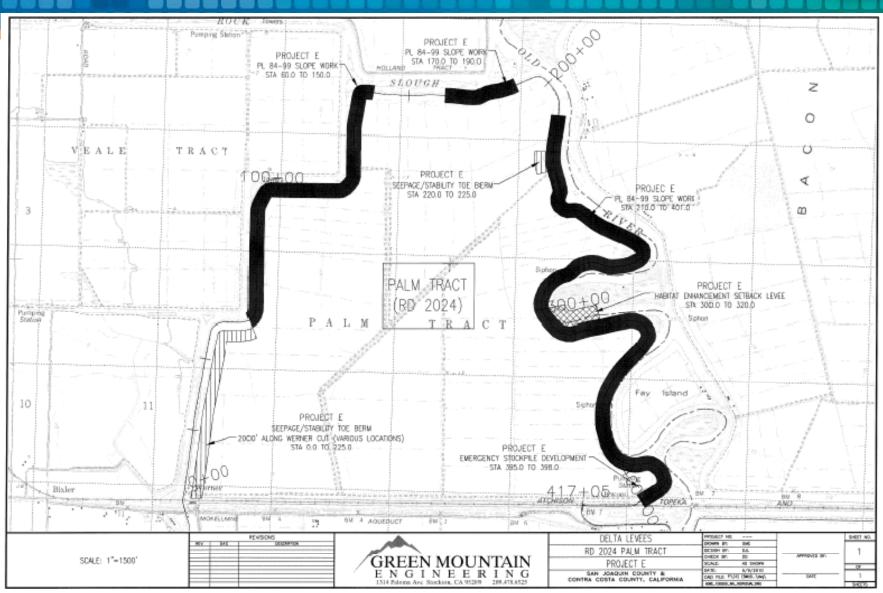
### Lower Roberts Island, Reclamation District 684 - Project Due



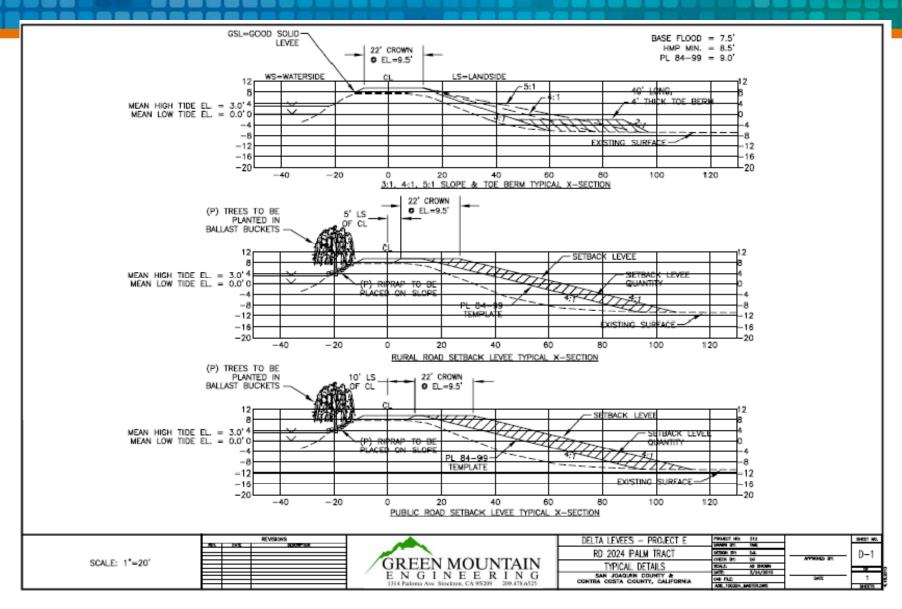
### Lower Roberts Island, Reclamation District 684 - Project Duck



## Orwood and Palm Tracts, Reclamation District 2024 - Projection



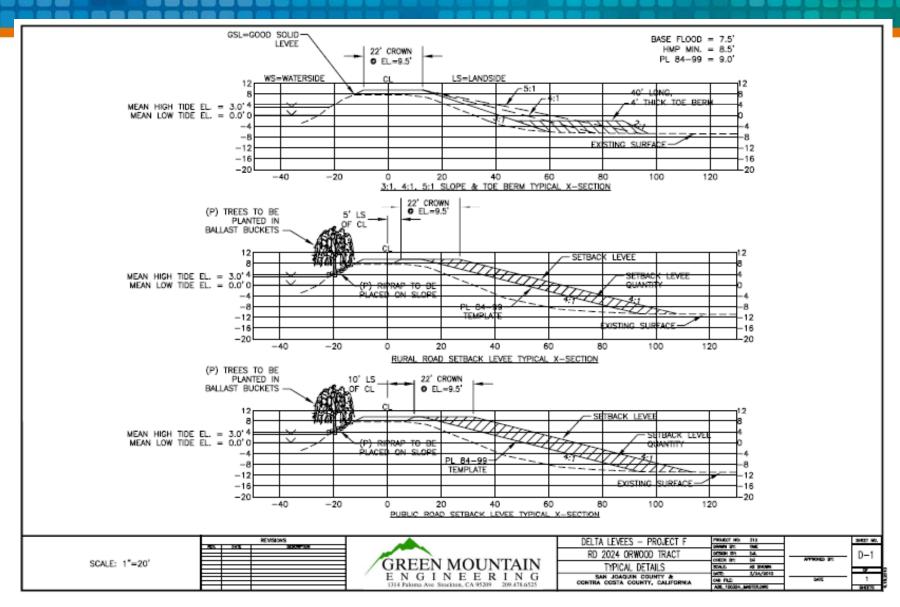
## Orwood and Palm Tracts, Reclamation District 2024 - Projection



## Orwood and Palm Tracts, Reclamation District 2024 - Projects

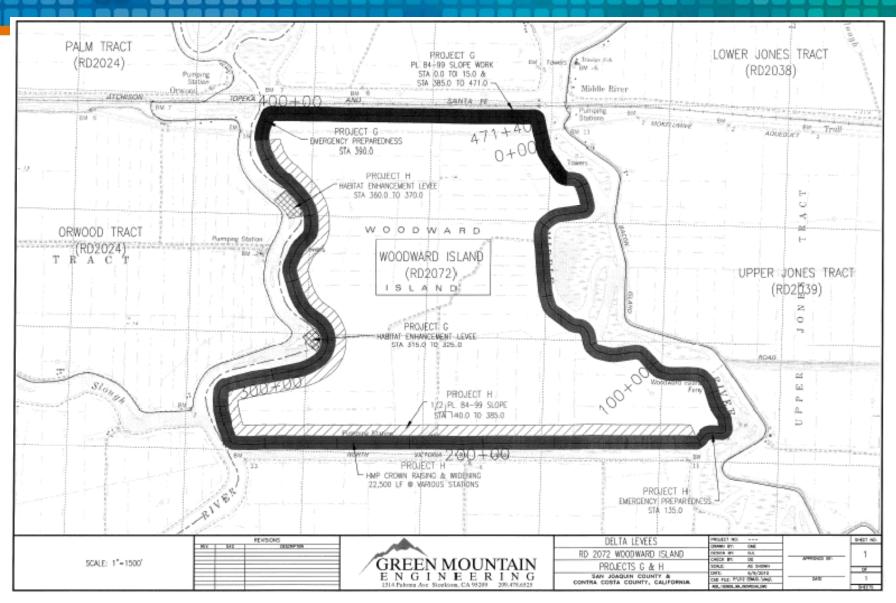


### Orwood and Palm Tracts, Reclamation District 2024 - Projection

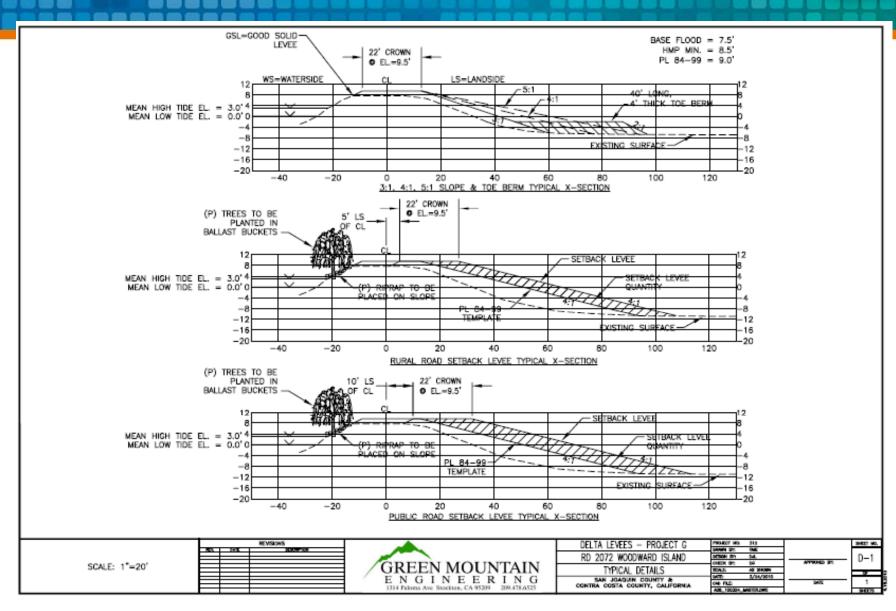


### Woodward Island, Reclamation District 2072 - Project

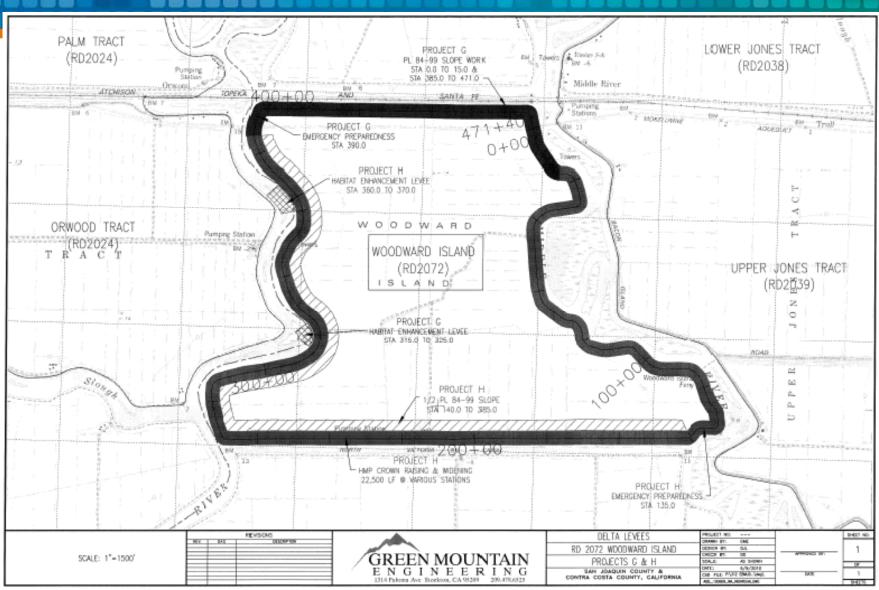




### Woodward Island, Reclamation District 2072 - Project Canal

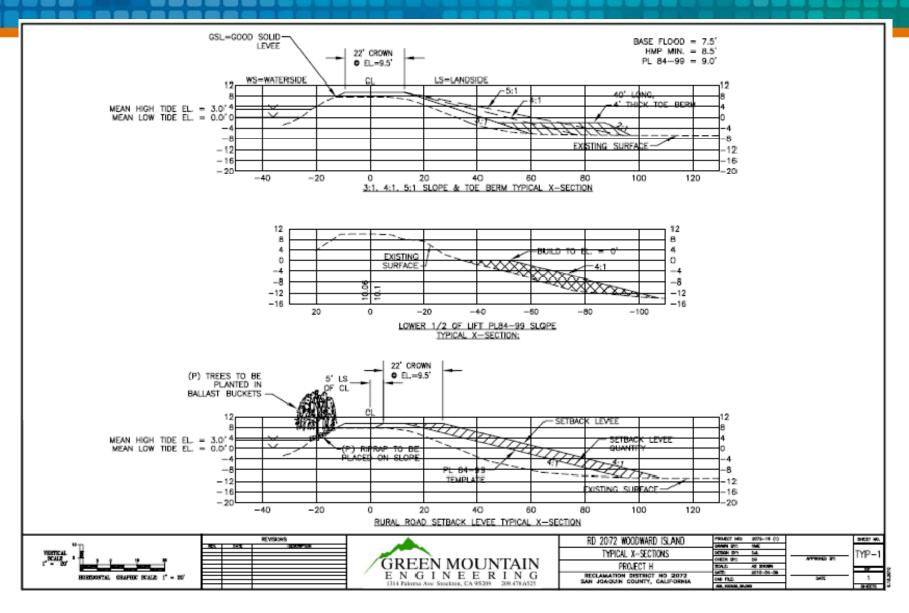


### Woodward Island, Reclamation District 2072 - Project HEBMUL



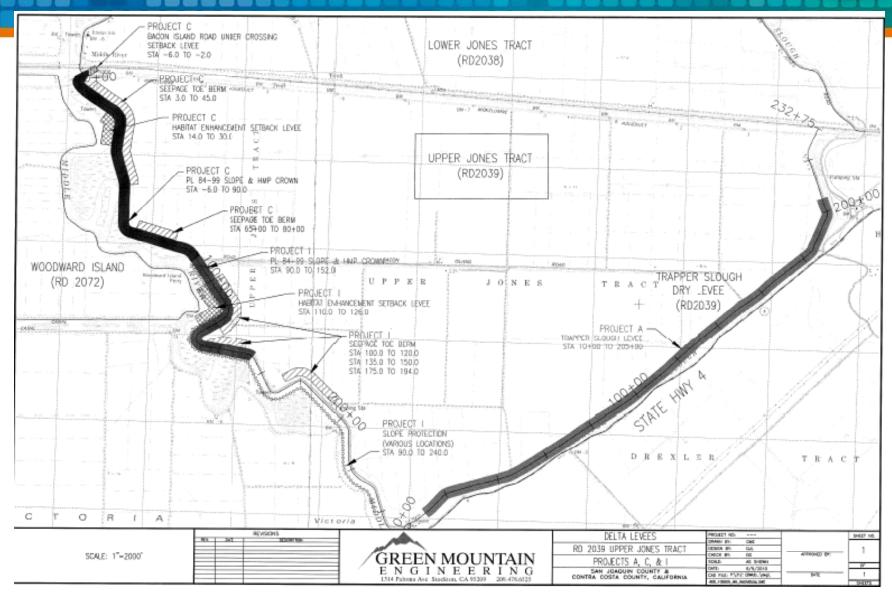
### Woodward Island, Reclamation District 2072 - Project F



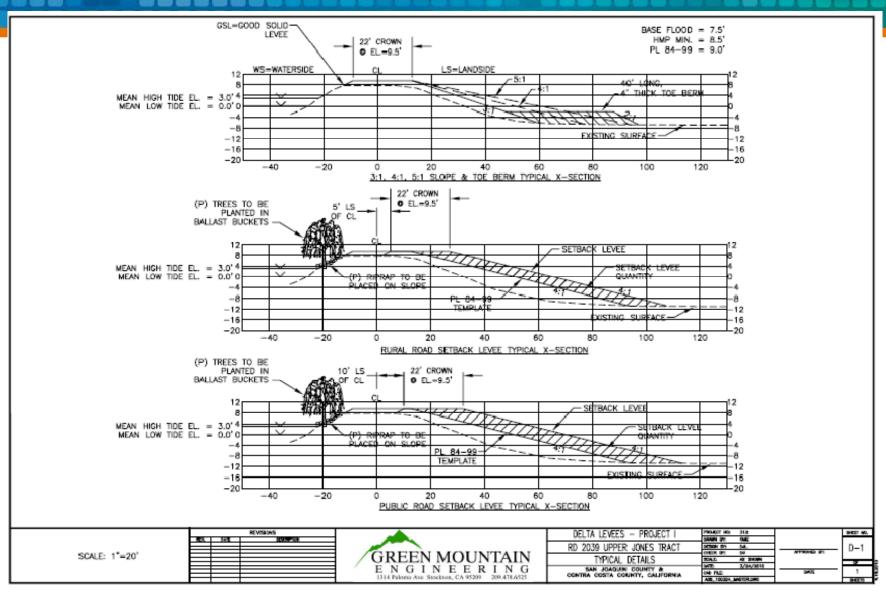


### Upper Jones Tract, Reclamation District 2039



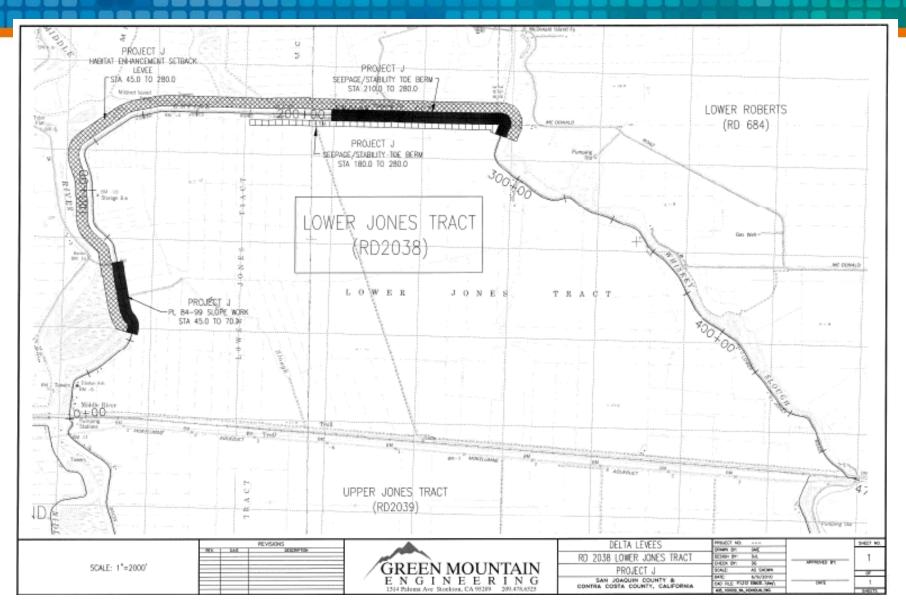


## Upper Jones Tract, Reclamation District 2039 – Project

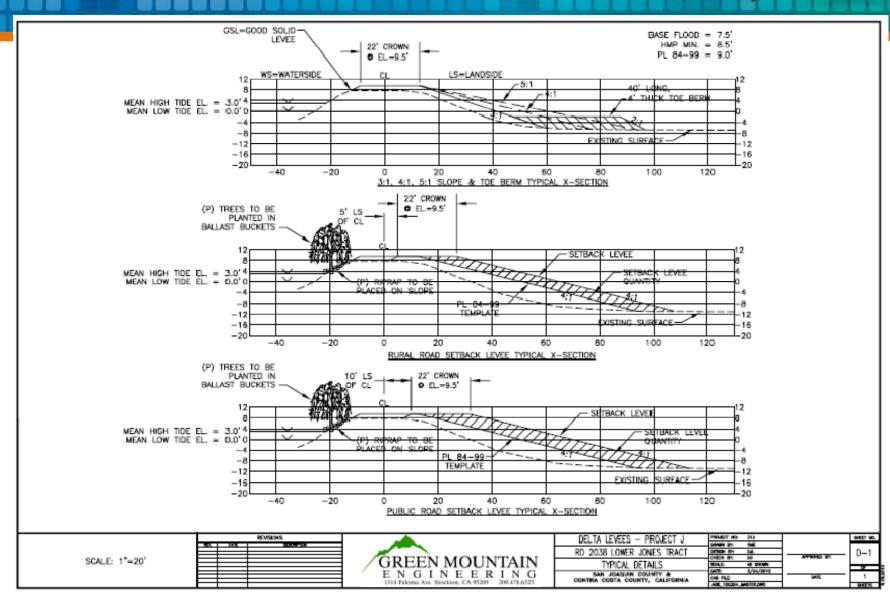


### Lower Jones Tract, Reclamation District 2038





### Lower Jones Tract, Reclamation District 2038 - Project Len



# Summary of Key Findings of Delta Risk Management Strategy



- 160 260 flood related island failures expected in the next 100 years
- 12 -15 simultaneous island failures in a major flood event
- 28% chance of 30+ islands failing simultaneously in a major earthquake in the next 25 years



# Mokelumne Aqueducts in the Delta

- Cross 5 islands/tracts
- 14 miles of pipeline on Islands/Tracts
- 10 miles is elevated
- 50 miles of levees
- 32,400 acres below sea level

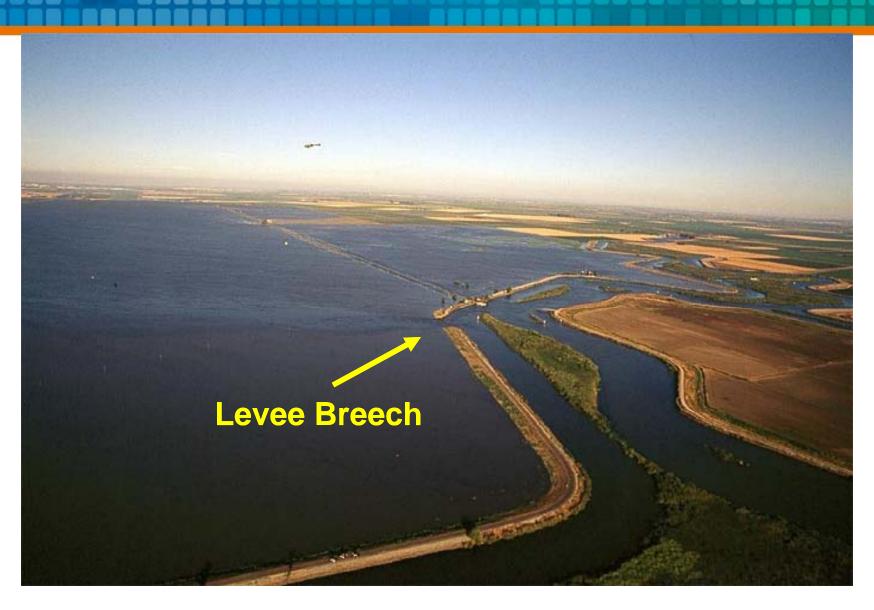
# Impact of Levee Failures



- EBMUD's Aqueducts
- Kinder Morgan petroleum pipeline
- Burlington Northern Santa Fe rail line
- State Highway 4
- Impact ecosystems in the Delta
- Adverse impacts to Old and Middle Rivers
- Compromise water supply to over 20 million people
- Major financial impact to the California economy

# Jones Tract Flooding - 2004







#### **Lower Roberts Island**



- Placed approximately 57,000 tons of import fill
- Placed approximately 1,800 tons of aggregate base

#### Lower Roberts Island



- Placement of approximately 50,000 tons of import fill
- Placement of approximately 17,000 tons of aggregate base
- Tree Planting

#### **Lower Jones Tract**



- Placed approximately 275,000 tons of import fill
- Placed approximately 87,000 tons of import fill in the Habitat Setback Levee

#### **Lower Jones Tract**



- Placement of approximately 2,000 tons of aggregate base
- Tree Planting

# **Upper Jones Tract**



- Clearing and grubbing
- Placed approximately 230,000 tons of import fill

# **Upper Jones Tract**



- Placement of approximately 58,000 tons of import fill
- Placement of approximately 4,000 tons of rock slope protection
- Placement of approximately 9,000 tons of aggregate base
- Tree Planting

#### **Woodward Island**



- Placed approximately 265,000 tons of import fill
- Relocated one siphon

#### **Woodward Island**



- Placement of approximately 25,000 tons of import fill
- Placement of approximately 10,000 tons of rock slope protection
- Placement of approximately 16,000 tons of aggregate base
- Tree Planting